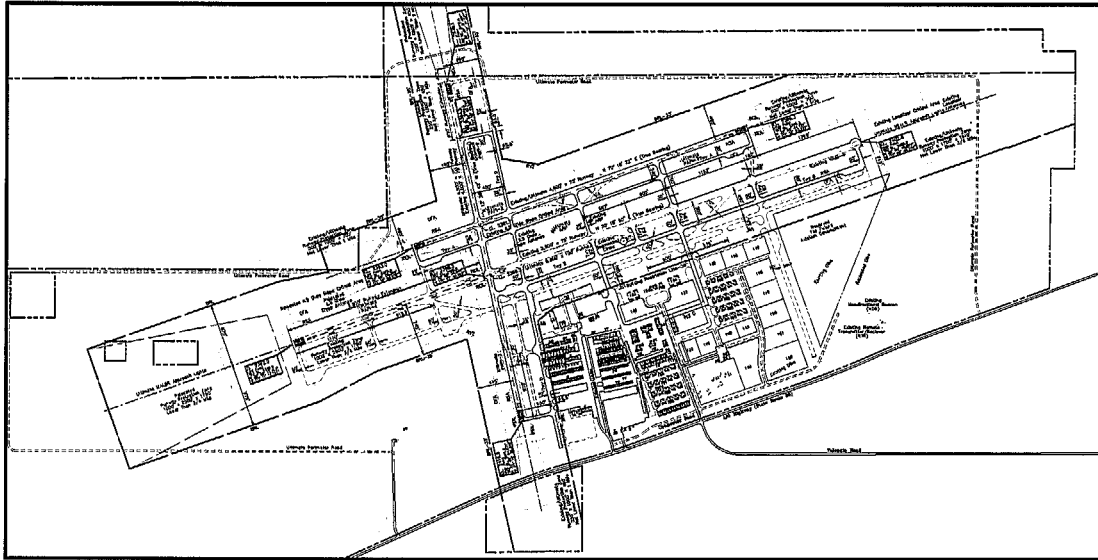




Chapter Five

AIRPORT PLANS

AIRPORT PLANS



In the last chapter an evaluation was made of future options for airfield and landside area development. This resulted in the selection of a development for future airport improvements that could accommodate the previously identified requirements for airport facilities. The purpose of this chapter is to describe in narrative and graphic form, the recommended development throughout the planning period.

A set of plans, referred to as **Airport Layout Plans**, has been prepared to graphically depict the recommendations for airfield layout, disposition of obstructions, and future use of land in the vicinity of the airport. This set of plans include:

- Airport Layout Drawing
- Part 77 Airspace Plan
- Approach Zones Plan
- Inner Approach Surfaces Plan
- Terminal Area Plan

- On-Airport Land Use Plan
- Airport Property Map

The airport layout plan set has been updated on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permit the user to focus in on any section of the airport at any desirable scale. The plan can be used as base information for design, and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys. The plan set is provided in 22-inch x 34-inch reproducible hard copy in accordance with current FAA standards.

DESIGN STANDARDS

Ryan Airfield (RYN) is currently identified as a general aviation airport

serving as a reliever to the Tucson International Airport. FAA Advisory Circular 150/5300-13, **Airport Design**, through Change 5 outlines recommended design standards for airports. These design standards are based upon the characteristics of the airplanes that the airport is expected to serve on a regular basis. Most critical to airport design are the weight, wingspan, and approach speed of the design aircraft. An airport's reference code (**ARC**) is based upon a combination of the aircraft approach category and the airplane design group (**ADG**).

Advisory Circulars published by the FAA have been used to provide general guidance in the overall planning effort. The guidance materials are designed to provide flexibility in application to ensure the safety, economy, and efficiency of the airport. In order to meet the needs of Ryan Airfield, the design standards selected were based upon different categories of aircraft and their specific needs.

In previous chapters it was determined that the critical aircraft at Ryan Airfield is in Approach Category B and ADG III (ARC B-III). This includes aircraft with wingspans up to 118 feet with approach speeds of less than 121 knots. The C-54's based at Ryan Airfield are the current critical aircraft.

In the future the airport can be expected to be used more frequently by business jets. Therefore the ultimate design of the airport should also incorporate ARC D-II. This would include aircraft with wing-spans of up to 79 feet and with approach speeds of less than 166 knots. This category is capable of accommodating a full range

of common general aviation business aircraft including the Grumman Gulfstream IV. The design standards used for Ryan Airfield and applicable to all future development, are summarized in **Table 5A**.

Both ARC B-III and D-II must be considered in future airport design, depending upon which has the more demanding design criteria. For example, ARC D-II is most demanding for runway design standards, but ARC B-III will continue to be more demanding with regard to taxiway design standards.

The parallel runway and the crosswind runway will continue to be designed for ARC B-II aircraft.

AIRPORT LAYOUT PLAN

The Airport Layout Plan (**ALP**) graphically presents the existing and ultimate airport layout. It depicts the recommended improvements which will enable the airport to meet forecast aviation demand. The ALP also shows areas of land acquisition to meet development standards and other requirements. The detailed airport and runway data are provided on the ALP to facilitate the interpretation of the master planning recommendation.

The Airport Layout Plan (**Sheet No. 2**) depicts the planned improvements associated with both the airfield and terminal area. The improvements in the terminal area are illustrated in more detail and in a larger scale on the Terminal Area Plan drawing and are discussed later in this chapter.

TABLE 5A
Airfield Planning Design Standards
Ryan Airfield

DESIGN STANDARDS	Runway 6R-24L		Runway 6L-24R	Runway 15-33
Airport Reference Code (ARC)	B-III, D-II		B-II	B-II
Runways				
Length (ft.)	8,300		4,900	4,800
Width (ft.)	100		75	75
Pavement Strength (lbs.)	73,000 D		30,000 S	12,500 S
Shoulder Width (ft.)	20		10	10
Runway Safety Area (RSA)				
Width (ft.)	540		150	150
Length Beyond End (ft.)	1,000		300	300
Runway Object Free Area				
Width (ft.)	800		500	500
Length Beyond End (ft.)	1,000		300	300
Centerline to:				
Holding Position (ft.)	250		200	125
Parallel Taxiway (ft.)	400		240	240
Parallel Runway (ft.)	700		700	700
Helipad (ft.)	700		700	700
Building Restriction Line (ft.) (35 ft. height clearance)	745		495	495
Taxiways				
Width (ft.)	50		35	35
Shoulder (ft.)	20		10	10
Centerline to:				
Fixed or Movable Object	93		66	66
Parallel Taxiway	152		105	105
Parallel Taxilane	140		97	97
Runway Protection Zones (RPZ)	6R	24L		
Inner Width (ft.)	1,000	1,000	500	250
Outer Width (ft.)	1,750	1,510	700	450
Length (ft.)	2,500	1,700	1,000	1,000
Approach Slope	50:1	34:1	34:1	20:1

Runway 6R-24L is the primary runway with a length of 5,500 feet by 75 feet wide. This runway is planned to remain as the primary runway in the future. The plan calls for ultimate extension of Runway 6R-24L to 8,300 feet by 100 feet wide. Analysis

presented in the forecasts and facility requirements chapters indicated the current length of the runway is adequate to accommodate 75 percent of the business jet fleet at 60 percent useful load. The runway should be widened to 100 feet to accommodate the

current design aircraft as well as business jets. Because the west threshold is located on Runway 15-33, it is recommended that the threshold be relocated further west regardless of future runway length requirements. This would provide better separation of aircraft using the two runways, thereby reducing congestion and improving safety.

To accommodate the full range of business jets at 60 percent useful load, the runway would need to be extended to 7,200 feet long. The analysis also indicated the potential for some business jets with longer trip lengths operating at the airport ultimately. In order to accommodate for this potential, plans for Runway 6R-24L to be extended to 8,300 feet long have been depicted.

Taxiway B is the full length parallel taxiway serving Runway 6R-24L. The runway/taxiway centerline separation requirement of 300 feet is adequate for the current ARC and would be adequate for ARC D-II runways with visibility minimums not lower than 3/4 mile. For a Category I instrument approach with minimums lower than 3/4 mile the runway/taxiway separation should be increased to at least 400 feet. A second parallel taxiway is planned 452 feet south of the runway centerline. This separation not only meets the design standard for instrument weather, but also is adequate to permit the continued use of Taxiway B in a dual system during VFR conditions. This will improve ground circulation as the flightline is developed to the east. The taxiways serving Runway 6L-24R should continue to be planned 50 feet wide and have the same pavement

strength as the runway. High speed exits have been planned for both landing directions.

Currently, Runway 6R-24L has a pavement strength rating of 30,000 pounds dual wheel loading (DWL). The C-54 aircraft that currently use the airport have a maximum takeoff weight of 73,000 pounds on dual wheel gear. A 73,000 pound dual wheel (DWL) pavement strength is planned for the runway to better accommodate the C-54 as well as future business jet use.

Runway 6R is currently served by a instrument landing system (ILS) approach. This system includes a glide slope, localizer, middle marker and outer marker. The minimums are 3/4 mile because there is not approach light system available. The ILS approach could ultimately be phased out by the FAA and replaced with a GPS precision approach. The transition to a GPS precision approach will not require the implementation of additional equipment because the approach is guided by satellites. Adding an approach light system, such as the MALSR, could lower the visibility to 1/2 mile. As the runway is extended to the west, the MALSR system would need to be relocated as well. Therefore, it is recommended that a MALSR installation be delayed until the runway is extended.

Runway 24L is not currently served by an instrument approach. In order to provide better instrument coverage for the primary runway, a GPS approach providing down to 3/4 mile visibility minimums has been planned. To attain these minimums below one mile,

installation of a short approach lighting system (SALS) would be required.

Parallel Runway 6L-24R is 4,900 feet long by 75 feet wide. Analysis conducted in **Chapter Three** indicated that the current length and width of Runway 6L-24R would be adequate to serve aircraft up through ARC B-II. Also, the current pavement strength rating of 30,000 DWL will be adequate as well. Runway 6L-24R has been planned for GPS approaches with visibility minimums greater than one mile.

Taxiway A is the parallel runway serving Runway 6L-24R. At 35 feet wide and 240 feet separation for the runway, it is adequate for the planning period. An extension of Taxiway 5 between the parallel runways will connect the east end of Runway 6L-24R with the terminal area. High speed exits have been planned in both directions. The location of the high speed exits was determined in accordance with FAA information regarding exit taxiway utilization percentages. An acute angle exit located between 2,000 and 2,500 feet from the threshold was determined to allow most single engine and some twin engine piston aircraft to utilize the exit. When Runway 6R is extended 2,800 feet to the west, an additional exit can be added. The earlier exit would still be useful by business jet and turboprop aircraft.

Crosswind Runway 15-33 is being paved in 1999 to 4,000 feet long by 75 feet wide. Analysis conducted in Chapter Three indicated that this runway length should be planned to be increased to 4,800 feet in the future. This length

would provide adequate crosswind coverage for all small airplanes up to ARC B-II. The ALP depicts the extension of Runway 15-33 800 feet to the north. The runway width and pavement strength of 12,500 pounds single wheel loading (SWL) will be adequate for the planning period. Runway 15-33 has been planned for GPS approaches with visibility minimums greater than one mile.

Parallel Taxiway D is located 450 feet from the centerline of Runway 15-33. This exceeds the design standard separation. A partial parallel taxiway is planned between Taxiway D and the runway to improve circulation along the flightline in the terminal area. The new taxiway is planned at 240 feet separation from the runway. This taxiway is planned at 35 feet wide and will provide increased operational safety and efficiency to taxiing aircraft, especially in the current T-hangar area. Taxiway D ranges in width from 40 feet at the south end to 35 feet at the north end. The designed standard of 35 feet will be maintained.

A helipad has also been incorporated into the plan. The helipad is located near the north apron and has been designed to have an approach parallel to the primary runway orientation as well as a perpendicular approach from the south over Aviator Lane. The 60 foot by 60 foot helipad is designed to accommodate helicopters up to the size of Blackhawk helicopter.

TERMINAL AREA PLAN

The Terminal Area Plan (**Sheet No. 3**) represents the planned development

configuration of future landside facilities at Ryan Airfield. The plan is designed to bring a focus of activity to the flightline in the future. In addition, the plan makes Airfield Drive the primary entrance into the airport.

The flightline at midfield along the primary runway will be developed with new apron fronted by fixed base operator facilities and a terminal/administration building at the north end of an extended Airfield Drive. The apron is designed with sufficient depth and clearances to accommodate business jet aircraft. A parking lot and a small loop road will serve the FBO's and the terminal. Adjacent parcels immediately south of the new flightline area are also available for development. While the terminal/administration building is shown, it may be developed by one of the FBO's rather than the Airport Authority.

Additional hangar development is planned for both sides of Airfield Drive. On the west side, an area for T-hangars and executive box hangars is planned along a re-aligned Taxiway 2. A connector road between Airfield Drive and Aviator Lane at the south end of this area is already under design. This will permit traffic to circulate on the airport without having to enter Ajo Highway.

With the development of the connector road system, the airport will have the capability to limit public access to one entrance during nighttime hours. While Aviator Lane could remain accessible from the highway during normal operating hours, a gate could be installed to be closed after hours for security purposes. In the long range, it is the desire of the Airport Authority to

have a single, primary entrance into Ryan Airfield at Airfield Drive.

On the east side a large four-acre parcel is maintained for the aerial firefighting facility. This space is adequate for maintenance hangar and parking apron development for the C-54 aircraft. Taxiway 4 is planned to be extended to the south to provide access to four parcels for corporate facilities. The taxiway will also extend airside access to the airport maintenance area as well. A parcel immediately north of the existing maintenance area is reserved for future expansion of the maintenance area.

Further south, parcels are planned that can be used for facilities that do not need direct access to the airfield. This could include a dormitory and campus for flight training or office space. Development of this area will require the removal of the mobile homes located in this area. This will need to be done in compliance with the Arizona Mobile Home Parks Residential Landlord and Tenant Act which requires that a minimum notice of six months be given to the tenants.

The western portion of the terminal area, along Aviator Lane is currently the most developed area. Future development plans include allowing space for an expansion of the flight training facility in the southwest corner. A self-serve fuel island is also planned at the north end on the east side of Taxiway D. This area includes the fuel island as well as room for an additional clear span hangar. A self-maintenance bay is planned near the aircraft wash rack at the existing north apron. A taxiway and helicopter apron is planned adjacent to the proposed helipad location.

New terminal area is planned for development east of Taxiway 4. A connector road fronting the highway will provide access to this area. Taxiway 5 would be extended south to open up additional area for airfield access. The east area includes three parcels fronting additional parking apron on the flightline. Along the east side of Taxiway 4, additional T-hangar area is planned. Taxiway 5 will serve larger parcels ranging in size from 2.8 acres to over five acres to serve aviation-related development.

AIRSPACE PLAN

The airspace plan for Ryan Airfield is based on Federal Aviation Regulation (F.A.R.) Part 77, **Objects Effecting Navigable Airspace**. In order to protect the airspace and approaches to each runway from hazards which would affect the safe and efficient operation of the airport, federal criteria has been established (F.A.R. Part 77) for use by local planning and land use jurisdictions to control the height of objects in the vicinity of the airport.

The FAR Part 77 (Sheet No. 4) Airspace Plan drawing is also used to indicate obstructions which are located within the imaginary surfaces applicable to Ryan Airfield. The Part 77 Airspace Plan assigns three-dimensional imaginary areas to each runway. These imaginary surfaces emanate from the runway centerline and are dimensioned to protect approaching and departing aircraft from the potential hazard of obstructions. The plan depicts the critical surfaces for a precision instrument approach to Runway 6R, as

well as future nonprecision instrument GPS approaches to all other runway ends. The Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface. Part 77 imaginary surfaces are described in the following paragraphs.

Primary Surface

The primary surface is an imaginary surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each runway end and its width is determined by the type of approach established for that runway end (i.e. visual, nonprecision, precision). The elevation of any point on the primary surface is the same as the elevation along the nearest associated point on the runway centerline. Due to existing and planned instrument approaches, the primary surface for Runway 6R-24L is 1,000 feet wide. For the other two runways, the primary surface will be 500 feet wide due to the planned non-precision instrument approaches.

Situated adjacent to the runway and taxiway system, the primary surface must remain clear of unnecessary objects in order to allow unobstructed passage of aircraft. Within the primary surface, objects are only permitted if they are no taller than two feet above the ground and if they are constructed on frangible (breakaway) fixtures. The only exception to the two-foot height requirement is for objects whose location is fixed by function. Glide slope antennae and equipment shelters are examples of such objects within the category of "fixed by function".

Approach Surface

An approach surface is also established for each runway. The approach surface begins at the same width as the primary surface and extends upward and outward from the primary surface end centered along an extended runway centerline. The upward slope and length of the approach surface are again determined by the type of approach (existing and/or planned) to the runway end. For Runway 6R a precision approach surface is shown. For the other runway nonprecision approach surfaces are shown. These approach surfaces are more fully described within the section regarding Runway Approach Zone Plans and Profiles.

Transitional Surface

Each runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The transitional surface also connects with the approach surfaces of each runway. The surface rises at a slope of 7 to 1 up to a height which is 150 feet above the highest runway elevation (2415 feet MSL). At that point, the transitional surface is replaced by the horizontal surface.

Horizontal Surface

The horizontal surface is established at 150 feet above the highest elevation of the runway surface. Having no slope, the horizontal surface connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the primary surfaces of each runway. At Ryan Airfield, the

horizontal surface will be at an elevation of 2565 feet MSL.

Conical Surface

The conical surface begins at the outer edge of the horizontal surface. The conical surface then continues for an additional 4,000 feet horizontally at a slope of 20 to 1. Therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation (2,765 feet MSL).

APPROACH ZONE PROFILES

The Approach Zones Profiles (Sheet No. 5) are a profile representation of the approach surfaces of each runway. The drawing depicts the physical features in the vicinity of each runway, including topographic changes, roadways, drainage ditches, and trees. The dimensions and angles of approach surfaces are a function of the runway service category and the approach classification. The existing approach to Runway 6R is a nonprecision approach with a 34 to 1 approach slope beginning 200 feet from the end of the runway and extending for 10,000 feet. The future approach for Runway 6R is a precision instrument approach requiring a 50 to 1 slope beginning 200 feet from the end of the runway to a distance of 50,000 feet. The existing approaches to the Runways 6L, 24R, 24L, 15, and 33 are visual approaches with 20:1 approach slopes beginning 200 feet from the end of the runway landing threshold to a distance of 5,000 feet. A 34 to 1 slope ratio is planned for the future non-precision approaches to Runways 6L,

24R, and 24L. Runway 15-33 will maintain 20 to 1 approach slopes even with the planned non-precision instrument approaches.

INNER APPROACH SURFACES

The Runway Protection Zones (RPZ) are depicted on Inner Approach Surface Drawings (**Sheet Nos. 6 through 9**). These drawings consist of a large scale plan and profile view of the inner portion of the runway approach surfaces. This plan facilitates identification of obstructions, roadways, and buildings that lie within the confines of the critical approach area located off the end of each runway.

As depicted on the plans, the current airport property boundaries encompass all of the runway protection zone for Runways 6R, 24R, and 33. The approaches to Runways 15 and 33 feature the largest protection zones because of the low visibility minimums provided by each approach. The protection zone for Runway 6R is currently 1,000' x 1,700' x 1,510'. The addition of a MALSR would lower the runway minimums below 3/4 mile increasing the size of the RPZ to 1,000' x 2,500' x 1,750'.

The current RPZ for Runways 24L, 6R, and 24R are 500' x 1,000' x 700'. With the upgrade to Runway 6R-24L and the addition of an approach down to 3/4 mile, the Runway 24L RPZ will increase to 1,000' x 1,700' x 1,510'. The RPZ's for Runway 6R-24L will remain the same with the establishment of a GPS approach.

The RPZ's for Runway 15-33 are 250' x 1,000' x 400' for the visual approaches. These dimensions will remain the same for a GPS approach to this runway.

Portions of the RPZ's for Runways 6L, 24L, and 15 extend beyond the existing property. Fee simple purchase is recommended to control all existing and future RPZ's.

AIRPORT LAND USE PLAN

The objective of the Airport Land Use Plan (**Sheet No. 10**) is to coordinate uses of the airport property in a manner which is functional with the design of the airport and compatible with airport environs. Therefore, both on and off-airport land use are presented on this plan. In addition, noise exposure contours are overlaid to depict compatibility of the airport operations with the airport environs.

ON-AIRPORT LAND USE

Airport land use planning is important for the orderly development and efficient use of available space. There are two primary considerations for on-airport land use planning. These are, first, to secure those areas essential to the safe and efficient operation of the airport; and, second, to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community. The plan depicts the recommendations for ultimate land use development on the airport. When development is proposed it should be directed to the appropriate land use area depicted on this plan.

Several on-airport land use categories have been identified including:

Airport Operations (AOA) - The airfield operations area is the most critical category of land use since it includes all areas necessary for the safe operation on the airside of the airport. The included items are runway and taxiway safety areas and navigational critical areas. At the airport, this includes the existing runways, parallel taxiways, the planned helipad, and areas within the OFA, RPZ's and runway visibility zones.

General Aviation Area (GAA) - The general aviation area consists of facilities which provide for general aviation fueling, maintenance, and aircraft parking and storage. The GAA is located in the southeast quadrant of the area along the flightlines and along the access taxiways. General aviation activity and development is planned to be expanded primarily south and east of its present location.

Airport Support Area (ASA) - The airport support area is designated for the facilities necessary to ensure the continued safe and sufficient operation of the airport. This includes airport maintenance, the airport traffic control tower, as well as navigational and communication facilities. These areas typically require access to or clear visibility of the airfield.

Future Aviation Reserve (FAR) - To provide for the ultimate development of the airport, even beyond the long range planning horizon, additional area has been set aside for very long term development. FAR areas are adjacent to the existing aviation areas or located

in other quadrants with direct access to the AOA.

Aviation Related Campus/Office (ACO) - This use is designated to accommodate aviation-related campus or office activities that command a presence at the airport, but do not require direct airfield access. This could include a flight training or aviation vocational campus, dormitory facilities, or a small office park.

Aviation Industrial Support (AIS) - After providing the space necessary for aviation development, some of the remaining airport property is set aside for aviation industrial support. These airpark areas are intended to compliment the airport development and promote aviation-related commercial or industrial development on the airport.

Open Space Reserve (OSR) - Portions existing and proposed airport property that are maintained in reserve for potential development beyond the long range planning horizon. This includes the areas located beyond the planned RPZ's, as well as area that could support additional airfield development. Within the OSR, no future permanent development is allowed unless specifically planned in an update to this Master Plan. The OSR also includes property recommended for acquisition to protect the long range viability of Ryan Airfield.

OFF-AIRPORT LAND USE

The airport land use plan typically depicts surrounding land uses in relation to the airport that are within

the 65 DNL noise exposure contour. At Ryan Airfield, the 65 DNL will remain within proposed airport property throughout the planning period. These noise exposure contours were developed as part of a review with the existing FAR Part 150 Noise Compatibility Plan (NCP) for Ryan Airfield. This review is included in Appendix C of the Master Plan and includes updated information regarding surrounding off-airport land uses.

AIRPORT PROPERTY MAP

The primary purpose of the Airport Property Map (Sheet No. 11) is to

provide information on the acquisition and identification of all land tracts for analyzing the current and future aeronautical use of land acquired with Federal funds. Existing and future airport features (i.e. runways, taxiways, aprons, runway protection zones, hangars, terminal facilities, etc.) are depicted which indicate the aeronautical need for existing and future property limits. The plan indicates how various tracts of land were acquired (i.e. Federal funds, surplus property, local funds only, etc.). Also shown on this plan are easement interests in areas outside the fee property line.

AIRPORT LAYOUT PLANS FOR RYAN AIRFIELD TUCSON, ARIZONA



Prepared for
TUCSON AIRPORT AUTHORITY

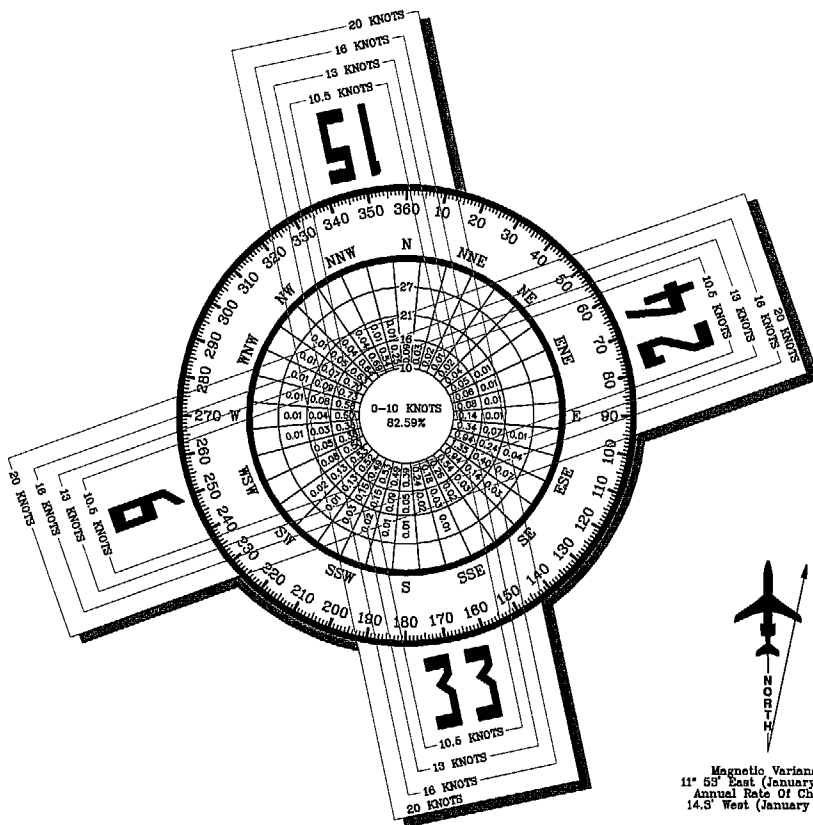
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APPROACH SURFACE DRAWING
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RUNWAY DATA	RUNWAY 8R-24L				RUNWAY 6L-24R				RUNWAY 15-33			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	6R	24L	6R	24L	6L	24R	6L	24R	15	33	15	33
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	B-III		B-III/D-II		B-II		B-II		B-II		B-II	
APPROACH VISIBILITY MINIMUMS (Lowest)	3/4 Mile		1/2 Mile		1/2 Mile		1 Mile		1 Mile		1 Mile	
F.A.R. PART 77 CATEGORY	3/4 Mile		Precision		Visual		Nonprecision		Visual		Nonprecision	
MAXIMUM ELEVATION (Above MSL)	2402.8		2402.8		2396.3		2396.3		2416.5		2416.5	
RUNWAY DIMENSIONS	5,600' ± 75'		8,800' ± 100'		4,900' ± 75'		4,900' ± 75'		4,000' ± 75'		4,800' ± 75'	
RUNWAY BEARING (Decimal Degrees)	N 70.3138° E		N 70.3138° E		N 70.3080° E		N 70.3080° E		N 12.5118° W		N 12.5118° W	
RUNWAY APPROACH SURFACES	34:1		34:1		20:1		20:1		20:1		20:1	
RUNWAY THRESHOLD DISPLACEMENT	0'		0'		0'		0'		0'		0'	
RUNWAY STOPWAY	0'		0'		0'		0'		0'		0'	
RUNWAY SAFETY AREA (RSA)	7,100' ± 400'		10,300' ± 540'		5,500' ± 150'		5,500' ± 150'		4,800' ± 150'		5,400' ± 150'	
RUNWAY SAFETY AREA (RSA) BEYOND RWY END	800'		1,000'		300'		300'		300'		300'	
RUNWAY OBSTACLE FREE ZONE (OFZ)	5,800' ± 400'		8,700' ± 400'		5,300' ± 400'		5,300' ± 400'		4,400' ± 250'		5,200' ± 250'	
RUNWAY OBJECT FREE AREA (OFA)	7,100' ± 800'		10,300' ± 800'		5,500' ± 500'		5,500' ± 500'		4,800' ± 500'		5,400' ± 500'	
RUNWAY OBJECT FREE AREA (OFA) BEYOND RWY END	800'		1,000'		300'		300'		300'		300'	
TAKEOFF RUN AVAILABLE (TORA)	5,600'		8,300'		4,900'		4,900'		4,000'		4,800'	
TAKEOFF DISTANCE AVAILABLE (TODA)	5,600'		8,300'		4,900'		4,900'		4,000'		4,800'	
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	5,600'		8,300'		4,900'		4,900'		4,000'		4,800'	
LANDING DISTANCE AVAILABLE (LDA)	5,600'		8,300'		4,900'		4,900'		4,000'		4,800'	
PAVEMENT SURFACE MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt		Asphalt		Asphalt	
RUNWAY PAVEMENT SURFACE TREATMENT	None		None		None		None		None		None	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.)	12.6(S)/30(D)		75(D)		12.6(S)/30(D)		12.6(S)/30(D)		12.6(S)		12.6(S)	
RUNWAY EFFECTIVE GRADIENT	0.064%		0.135%		0.067%		0.067%		0.800%		0.800%	
RUNWAY TOUCHDOWN ZONE ELEVATION	2402.0		2402.8		2395.0		2396.3		2410.3		2416.5	
RUNWAY MARKING	Precision		Nonprecision		Nonprecision		Nonprecision		Basic		Nonprecision	
RUNWAY LIGHTING	MIRL		MIRL		None		MIRL		None		MIRL	
RUNWAY APPROACH LIGHTING	None		MALSR		None		None		None		None	
RUNWAY HOLD LINE POSITION (From Runway Centerline)	200'		200'		200'		200'		125'		125'	
TAXIWAY LIGHTING	None		MTL		None		MTL		None		MTL	
TAXIWAY MARKING	Centerline		Centerline		Centerline		Centerline		Centerline		Centerline	
TAXIWAY SURFACE MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt		Asphalt		Asphalt	
TAXIWAY WIDTH	60'		50'		55'		55'		40'		35'	
TAXIWAY SAFETY AREA WIDTH	186'		118'		79'		79'		79'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	186'		186'		131'		131'		131'		131'	
RUNWAY ELECTRONIC NAVIGATIONAL AIDS	ILS		None		CAT-I GPS		GPS		None		GPS	
	NDB/DME		None		None		None		None		None	
	GPS		CAT-I GPS		GPS		GPS		GPS		GPS	
RUNWAY VISUAL NAVIGATIONAL AIDS	REIL		VASI-4		None		None		None		None	
	None		MALSR		PAPI-2		PAPI-2		None		PAPI-2	
	None		PAPI-4		REIL		REIL		None		REIL	

THRESHOLD SITING SURFACE OBJECT PENETRATIONS		
OBJECT	PENETRATION	DISPOSITION
NONE		

OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS		
OBJECT	PENETRATION	DISPOSITION
NONE		

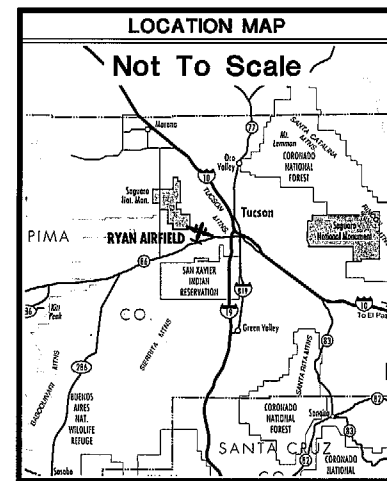
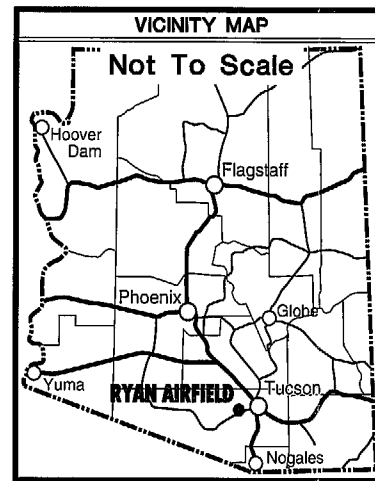


ALL WEATHER WIND COVERAGE				
RUNWAYS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
Runway 6-24	91.36%	95.73%	98.12%	99.85%
Runway 15-33	92.02%	96.02%	98.98%	99.81%
Combined	91.69%	95.88%	98.55%	99.83%

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina

AIRPORT:
Tucson International Airport
Tucson, Arizona

OBSERVATIONS:
87,644 All Weather Observations
1988 - 1989



AIRPORT DATA		
Ryan Airfield (RYN)		
CITY: Tucson, Arizona	COUNTY: Pima, Arizona	
RANGE: 11 East	TOWNSHIP: 16 South	CIVIL TOWNSHIP: N/A
		EXISTING
		ULTIMATE
AIRPORT SERVICE LEVEL		Reliever
AIRPORT REFERENCE CODE		B-III
DESIGN AIRCRAFT		C-64
AIRPORT ELEVATION		2408 MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		88.5° F (9)
AIRPORT REFERENCE POINT (ARP)		Latitude 32° 08' 31.979" N Longitude 111° 10' 28.475" W
COORDINATES (NAD 83)		Latitude 32° 08' 31.979" N Longitude 111° 10' 28.475" W
AIRPORT and TERMINAL NAVIGATIONAL AIDS		NDB/DME ILS AWOS-3 ATCT Rotating Beacon Segmented Circle BR
GPS Approach		ILS AWOS-3 ATCT Rotating Beacon Segmented Circle BR

RUNWAY END COORDINATES (NAD 83)		
RUNWAY	EXISTING	ULTIMATE
Runway 6R	Latitude 32° 08' 24.644" N Longitude 111° 10' 45.492" W	Latitude 32° 08' 16.217" N Longitude 111° 11' 16.161" W
Runway 24L	Latitude 32° 08' 42.872" N Longitude 111° 09' 45.268" W	Latitude 32° 08' 42.872" N Longitude 111° 09' 45.268" W
Runway 6L	Latitude 32° 08' 28.386" N Longitude 111° 10' 56.978" W	Latitude 32° 08' 28.386" N Longitude 111° 10' 56.978" W
Runway 24R	Latitude 32° 08' 44.731" N Longitude 111° 10' 03.327" W	Latitude 32° 08' 44.731" N Longitude 111° 10' 03.327" W
Runway 15	Latitude 32° 08' 43.286" N Longitude 111° 10' 49.605" W	Latitude 32° 08' 43.286" N Longitude 111° 10' 49.605" W
Runway 33	Latitude 32° 08' 04.671" N Longitude 111° 10' 39.348" W	Latitude 32° 08' 04.671" N Longitude 111° 10' 39.348" W

MODIFICATIONS FROM FAA AIRPORT DESIGN STANDARDS			
DEVIATION DESCRIPTION	AFFECTED DESIGN STANDARD	STANDARD EXISTING	PROPOSED DISPOSITION
None			

EXISTING BUILDINGS/FACILITIES	
NO.	DESCRIPTION
1	Restaurants
2	Fixed Base Operations Hangar
3	Residence
4	Fuel Facility
5	Pilot Training Facility
6	T-Hangar
7	Clearspan Hangar
8	Executive Hangar
9	Shade Hangar
10	Shade Hangar
11	Shade Hangar
12	Shade Hangar
13	Shade Hangar
14	Shade Hangar
15	Shade Hangar
16	Shade Hangar
17	Shade Hangar
18	Shade Hangar
19	Executive Hangar
20	Shade Hangar
21	Shade Hangar
22	Shade Hangar
23	Shade Hangar
24	Shade Hangar
25	Shade Hangar
26	Shade Hangar
27	Shade Hangar
28	Shade Hangar
29	Shade Hangar
30	Executive Hangar
31	Executive Hangar
32	Office Building
33	Wash Rack
34	Storage Shed
35	Air Traffic Control Tower
36	Conventional Hangar
37	Executive Hangar
38	Conventional Hangar
39	Conventional Hangar
40	Conventional Hangar
41	Conventional Hangar
42	Conventional Hangar
43	Conventional Hangar
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67	Conventional Hangar
68	Conventional Hangar
69	Conventional Hangar
70	T-Hangar
71	T-Hangar
72	T-Hangar
73	Conventional Hangar
74	Conventional Hangar
75	Clearspan Hangar
76	Conventional Hangar
77	Conventional Hangar
78	Auto Shad Ports
79	Auto Shad Ports
80	T-Hangar
81	T-Hangar
82	Conventional Hangar
83	Conventional Hangar
84	Conventional Hangar
85	Conventional Hangar
86	Conventional Hangar
87	Conventional Hangar
88	Conventional Hangar
89	Conventional Hangar
90	Conventional Hangar

EXISTING BUILDINGS/FACILITIES	
NO.	DESCRIPTION
91	Conventional Hangar
92	Conventional Hangar
93	Airport Maintenance Facility

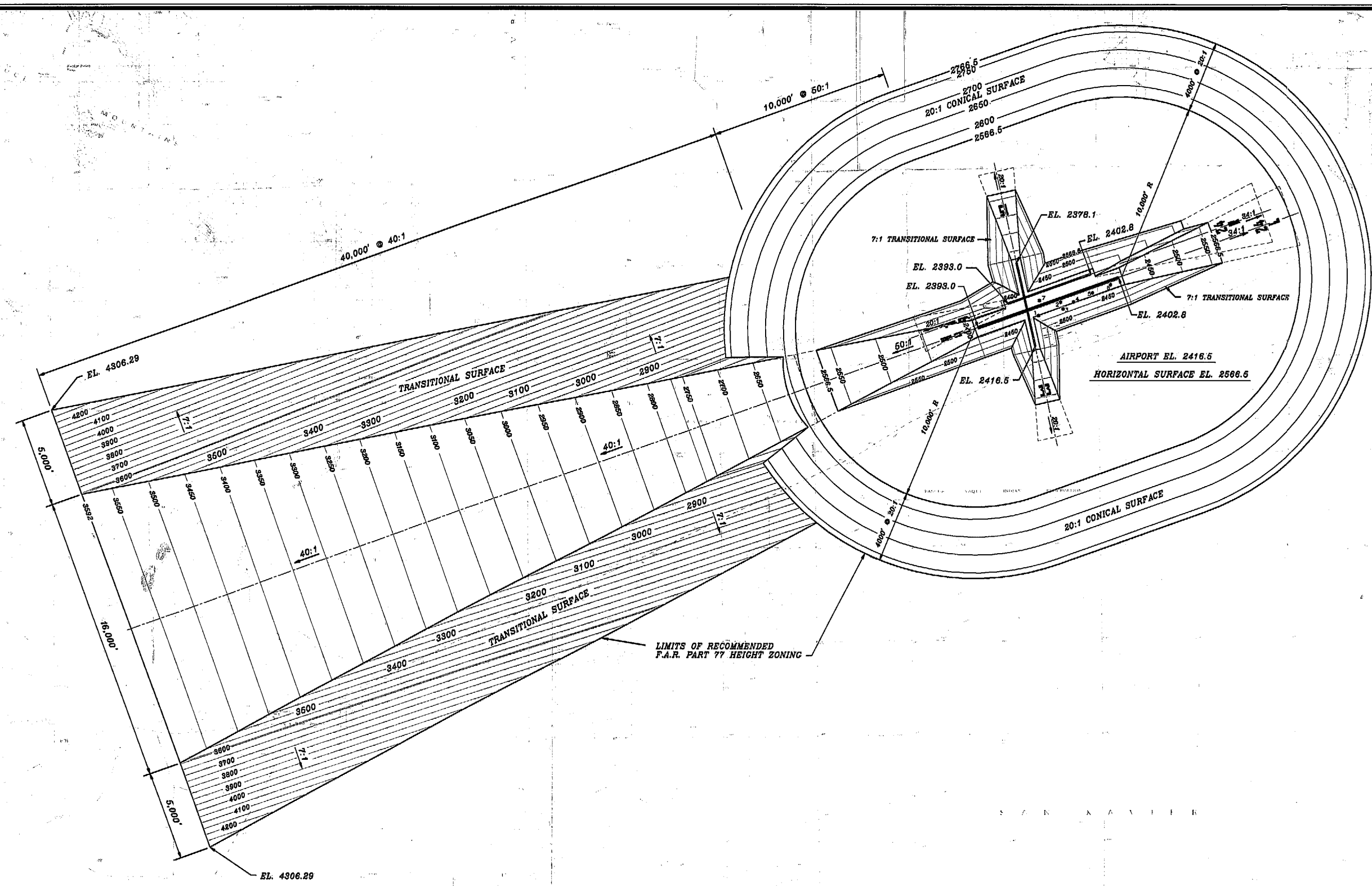
OBSTRUCTION LEGEND

OBSTRUCTION

- GROUP or MULTIPLE OBSTRUCTIONS
- TOPOGRAPHIC OBSTRUCTION

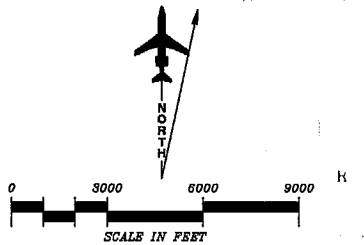
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- Existing and future height and hazard ordnances are to be amended and/or referenced upon approval of updated AIRPORT AIRSPACE DRAWING.
- Additional obstruction data is illustrated on National Ocean Survey document OC 6513, AIRPORT OBSTRUCTION CHART.



OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. GROUND	2401 MSL	PRIMARY SURFACE	2396 MSL	5'	REQUEST AERONAUTICAL STUDY
2. OL WINDSOCK	2428 MSL	PRIMARY SURFACE	2398 MSL	30'	REQUEST AERONAUTICAL STUDY
3. RON OL ANEMOMETER	2440 MSL	TRANSITIONAL SURFACE	2409 MSL	31'	REQUEST AERONAUTICAL STUDY
4. GROUND	2401 MSL	PRIMARY SURFACE	2397 MSL	4'	REQUEST AERONAUTICAL STUDY
5. GROUND	2401 MSL	PRIMARY SURFACE	2397 MSL	4'	REQUEST AERONAUTICAL STUDY
6. WINDSOCK	2416 MSL	PRIMARY SURFACE	2399 MSL	17'	REQUEST AERONAUTICAL STUDY
7. OL GLIDE SOPE	2426 MSL	PRIMARY SURFACE	2398 MSL	28'	REQUEST AERONAUTICAL STUDY



Ryan Airfield
AIRPORT AIRSPACE DRAWING
 Tucson, Arizona

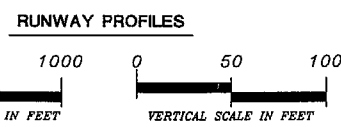
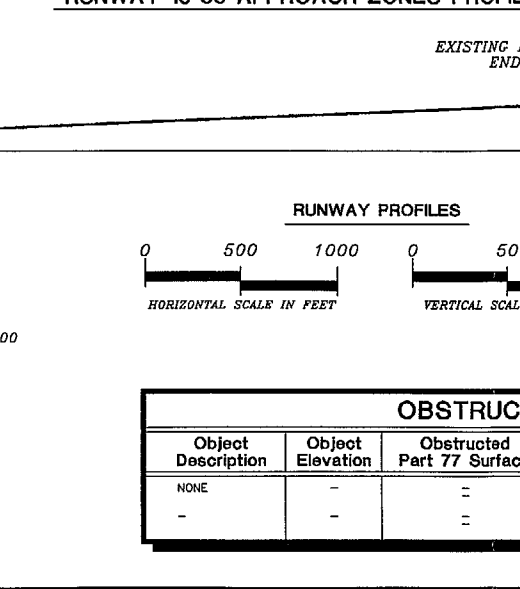
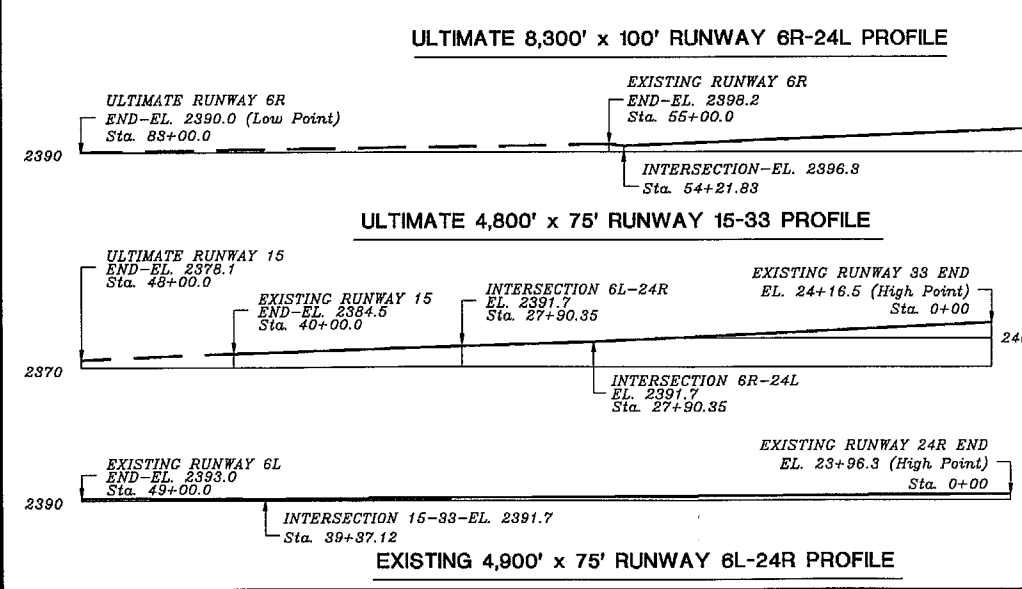
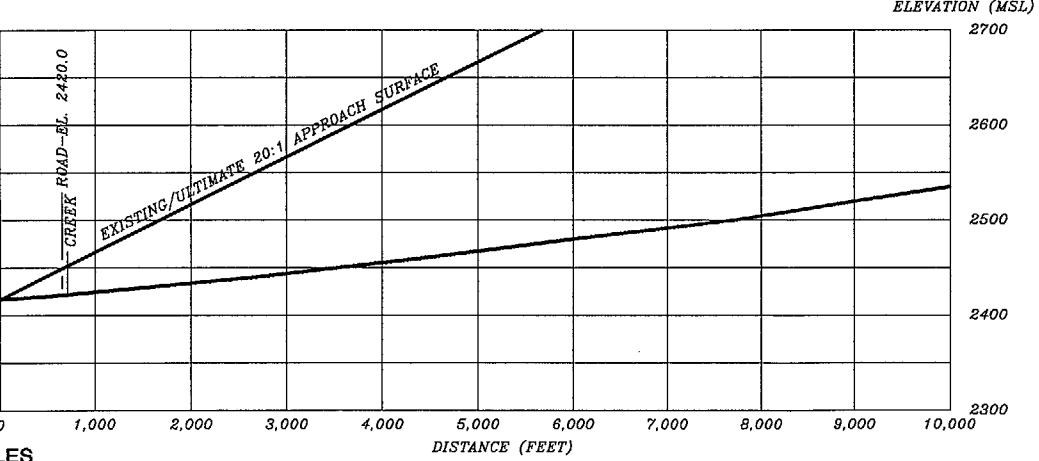
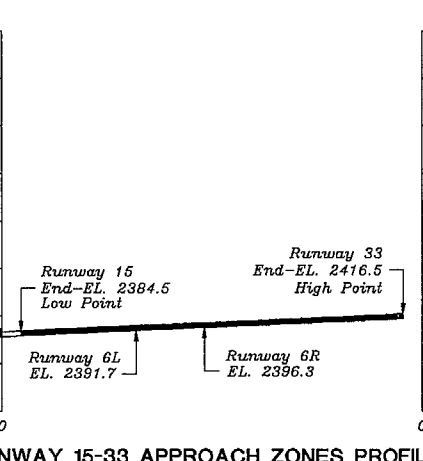
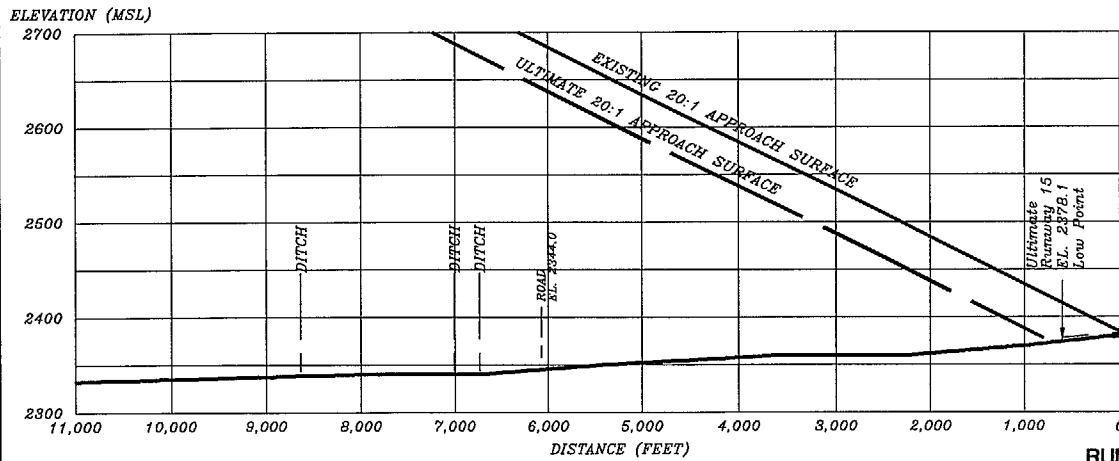
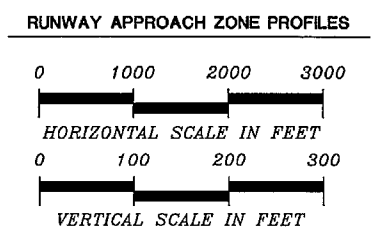
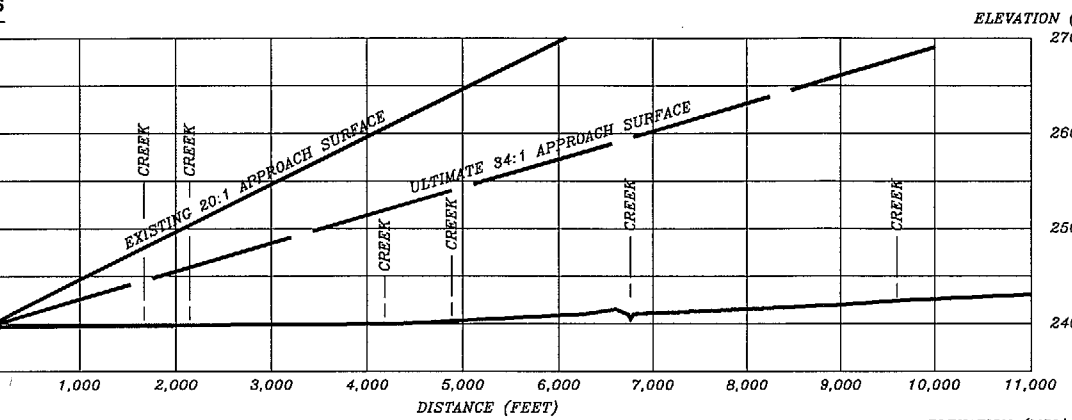
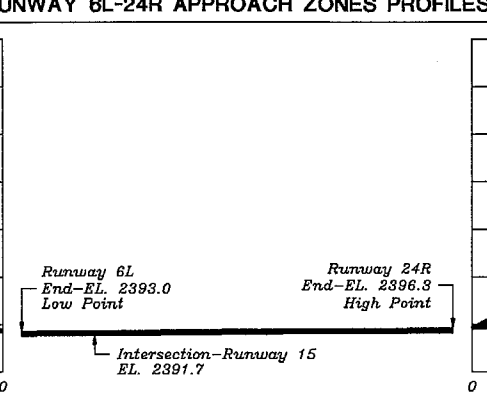
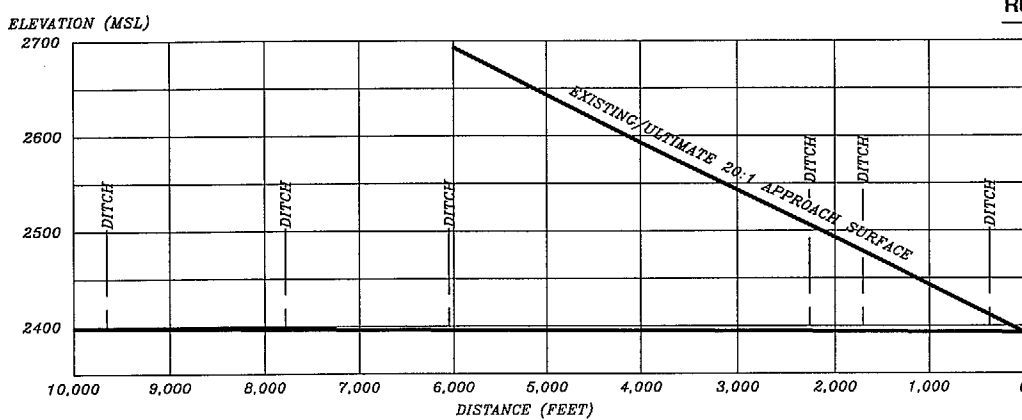
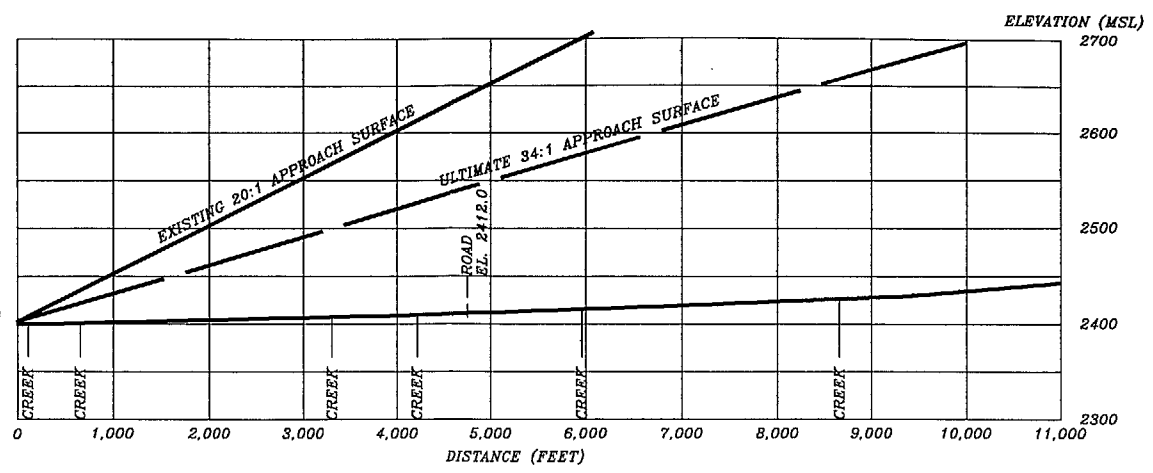
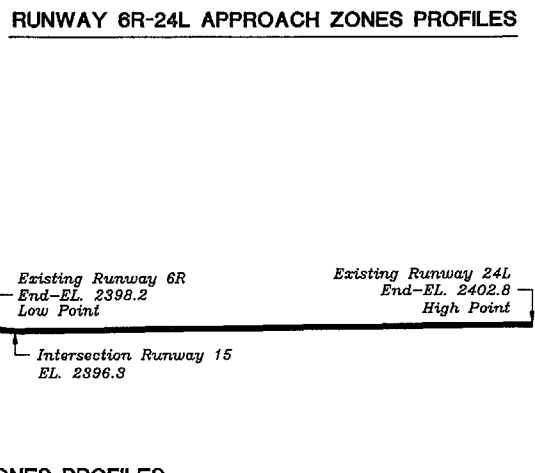
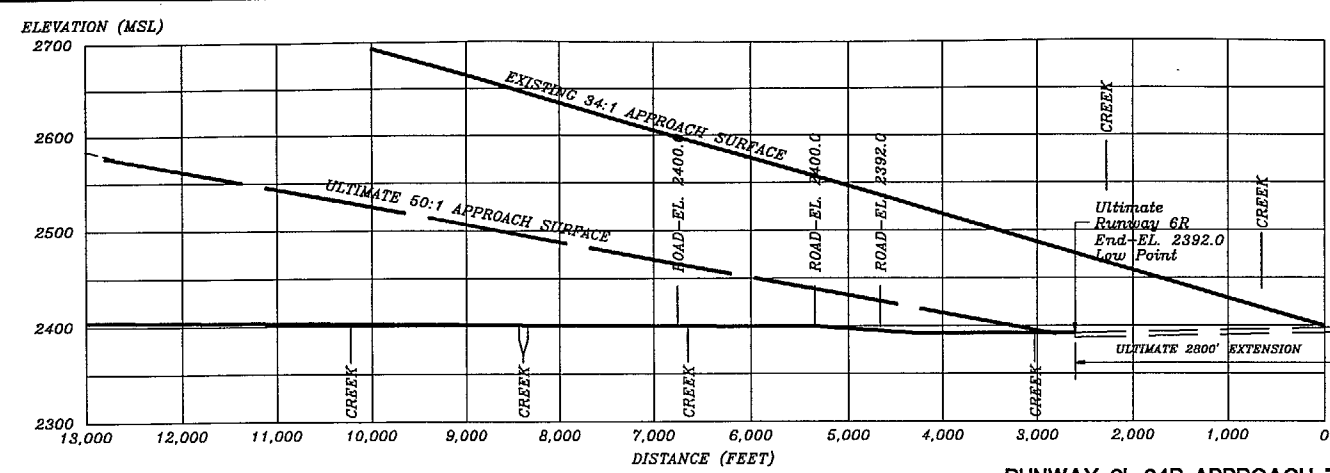
PLANNED BY: Steve S. Benson
 DETAILED BY: Larry S. Johnson
 APPROVED BY: Steve S. Benson

May 27, 1999 SHEET 4 OF 11

Goffman Associates
 Airport Consultants

No.	REVISIONS	DATE	BY	APP'D.

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OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	-	-	-	-	See Inner Portion of Runway Approach Surfaces Drawings
-	-	-	-	-	-

- GENERAL NOTES:**
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Ryan Airfield

APPROACH PROFILES DRAWING

Tucson, Arizona

PLANNED BY: *Steven S. Benson*

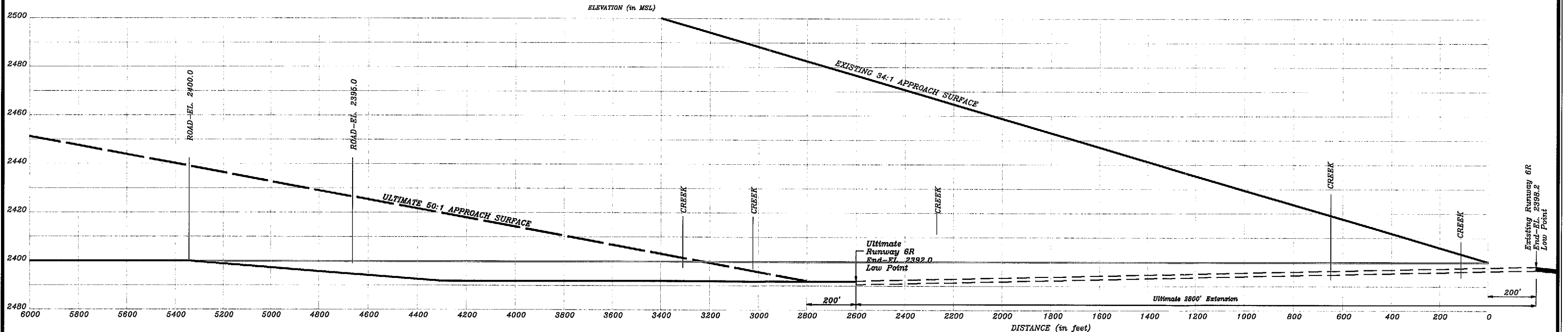
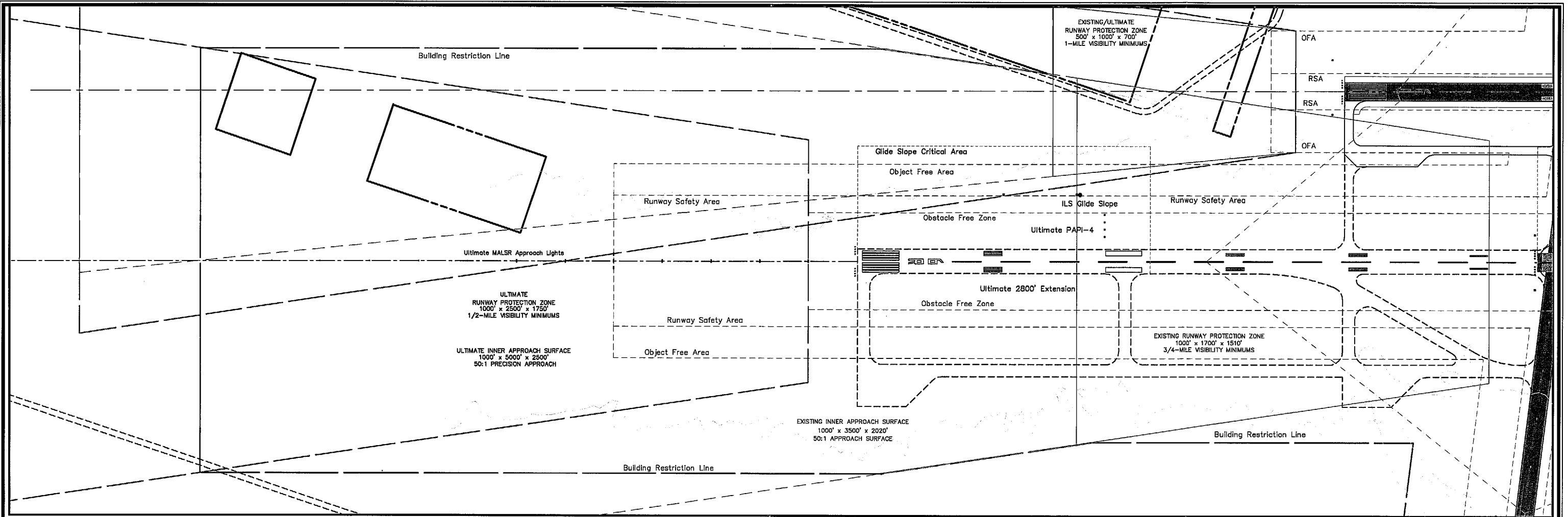
DETAILED BY: *Larry D. Johnson*

APPROVED BY: *Steven S. Benson*

June 25, 1999

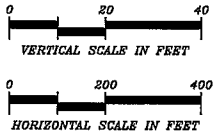
SHEET 5 OF 11

Coffman Associates
Airport Consultants



OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	-	-	-	-	REQUEST AERONAUTICAL STUDY
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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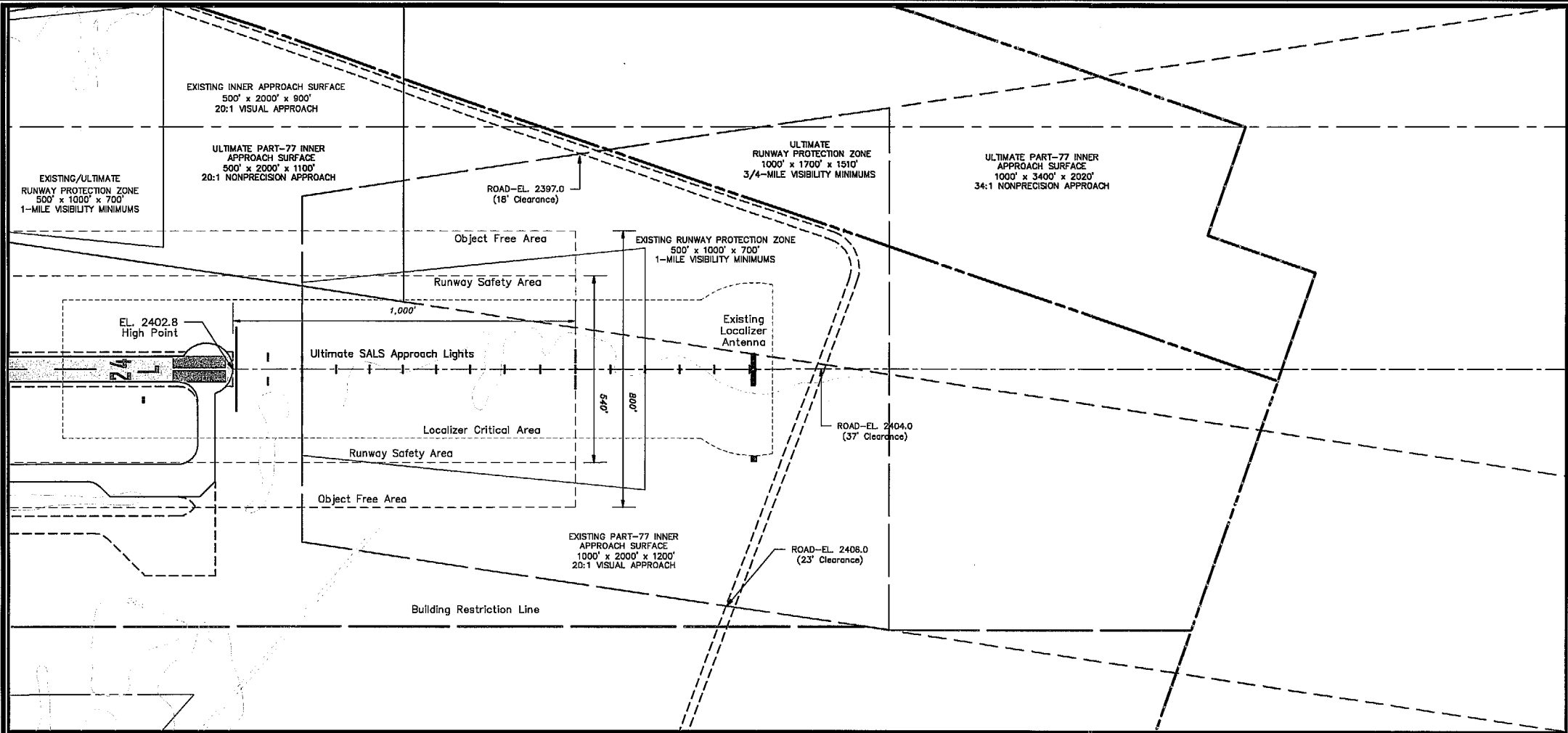
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Ryan Airfield
**INNER PORTION OF RUNWAY 6R
 APPROACH SURFACE DRAWING**
 Tucson, Arizona

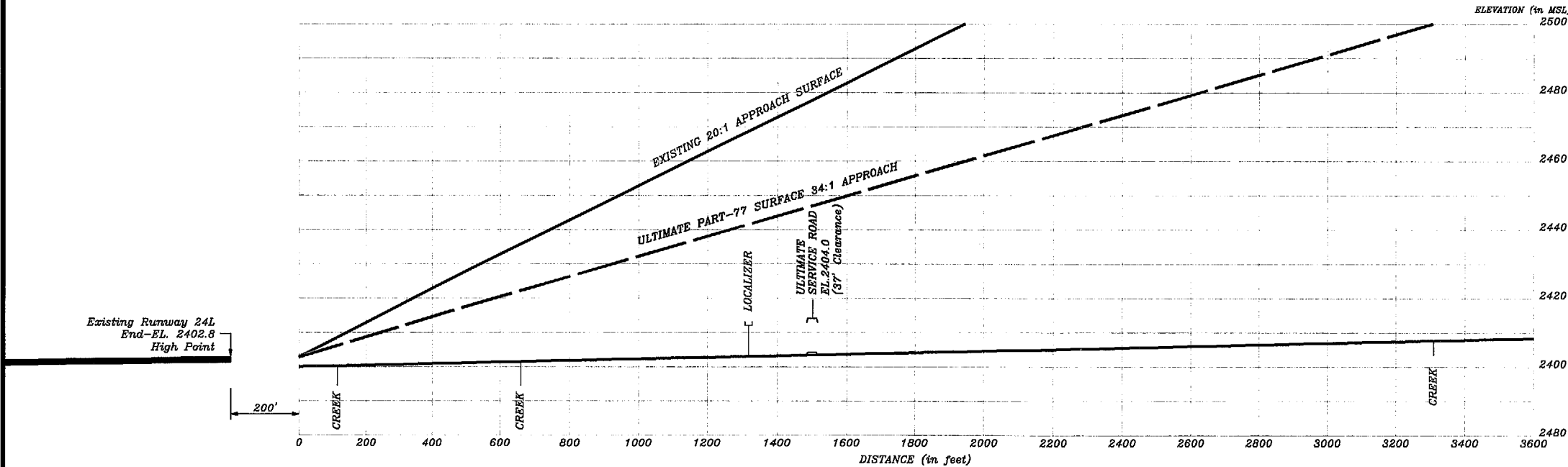
PLANNED BY: *Steven S. Benson*
 DETAILED BY: *Larry D. Johnson*
 APPROVED BY: *Steven S. Benson*

June 25, 1999 SHEET 6 OF 11

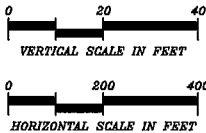
Coffman Associates
 Airport Consultants



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OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	-	-	-	-	REQUEST AERONAUTICAL STUDY
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-



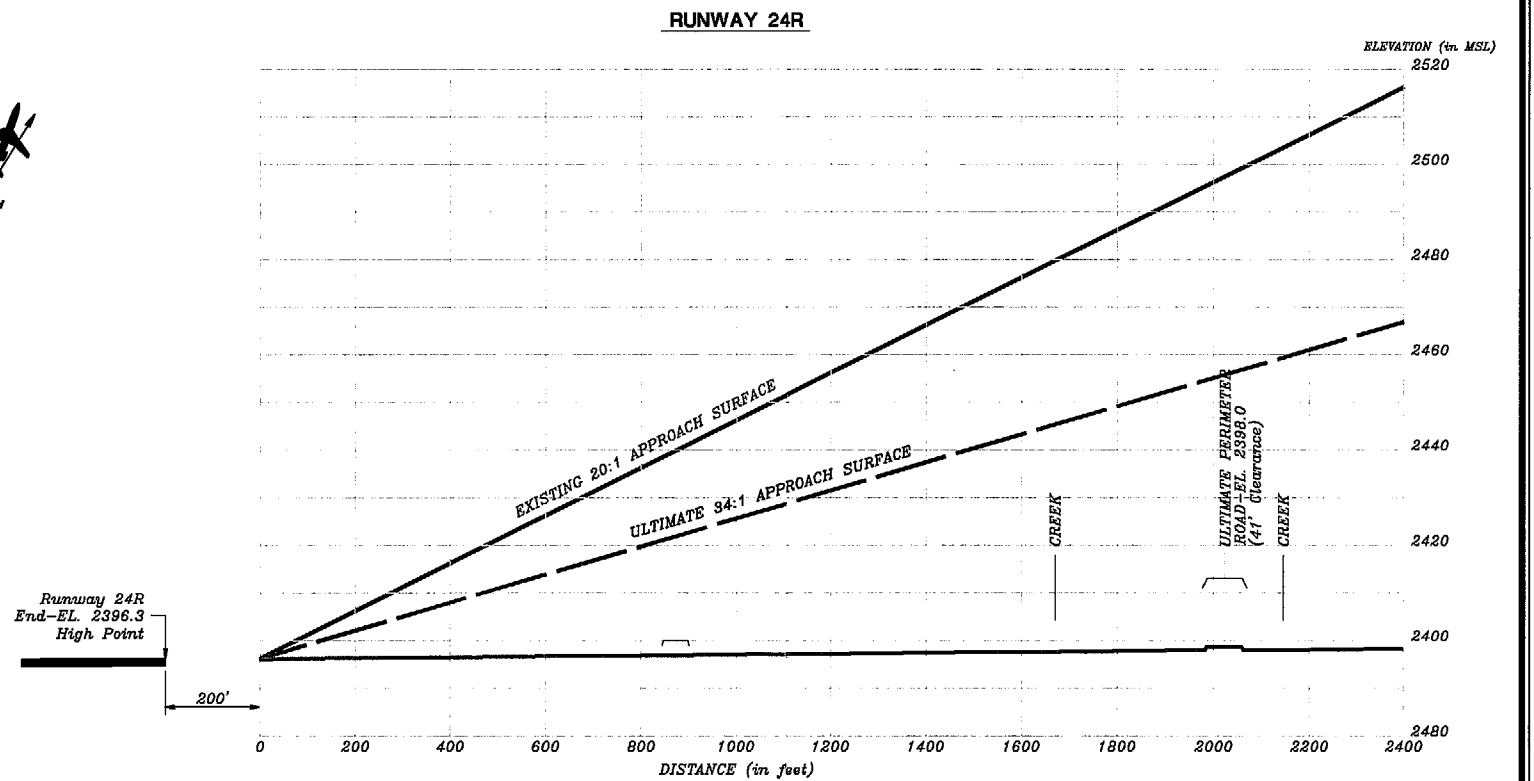
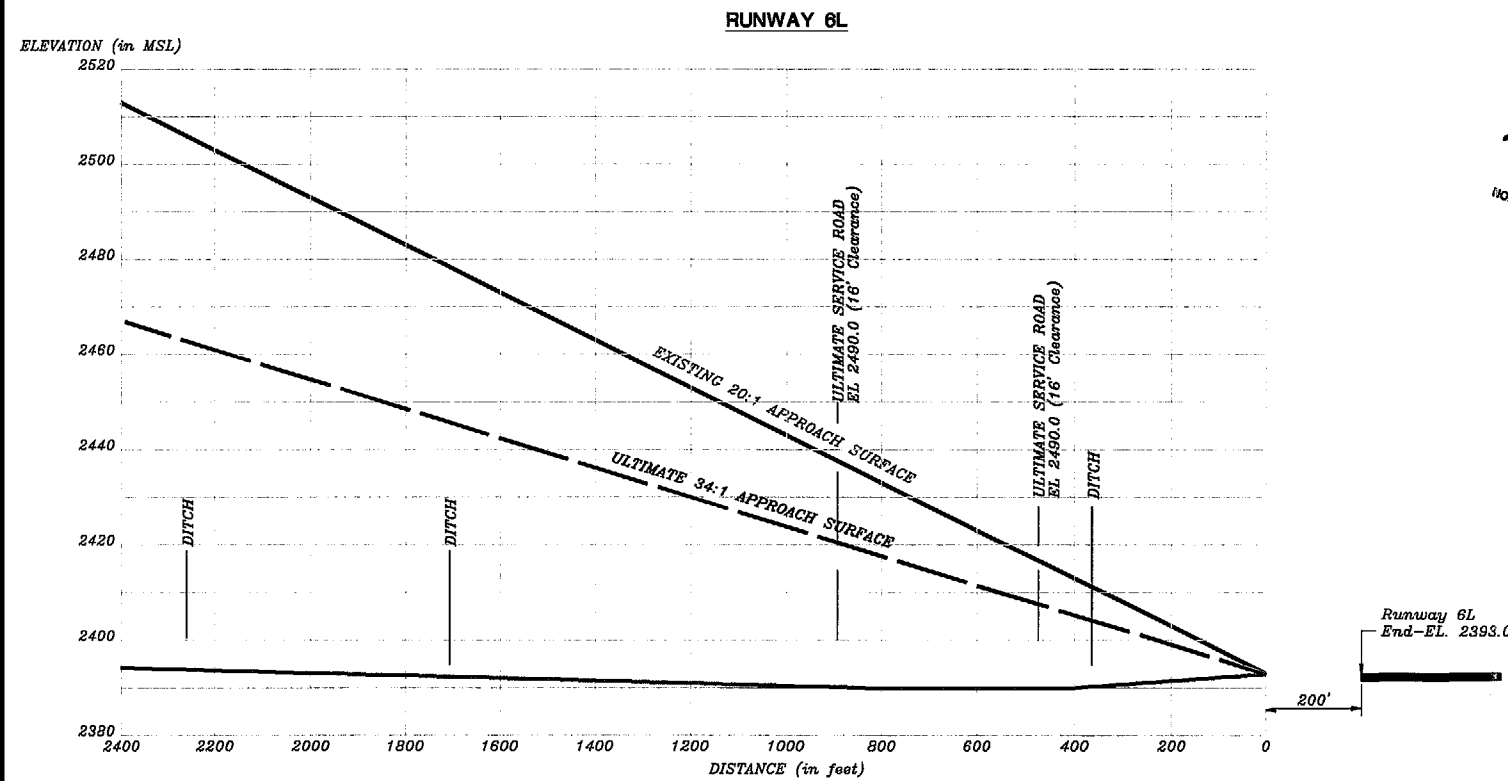
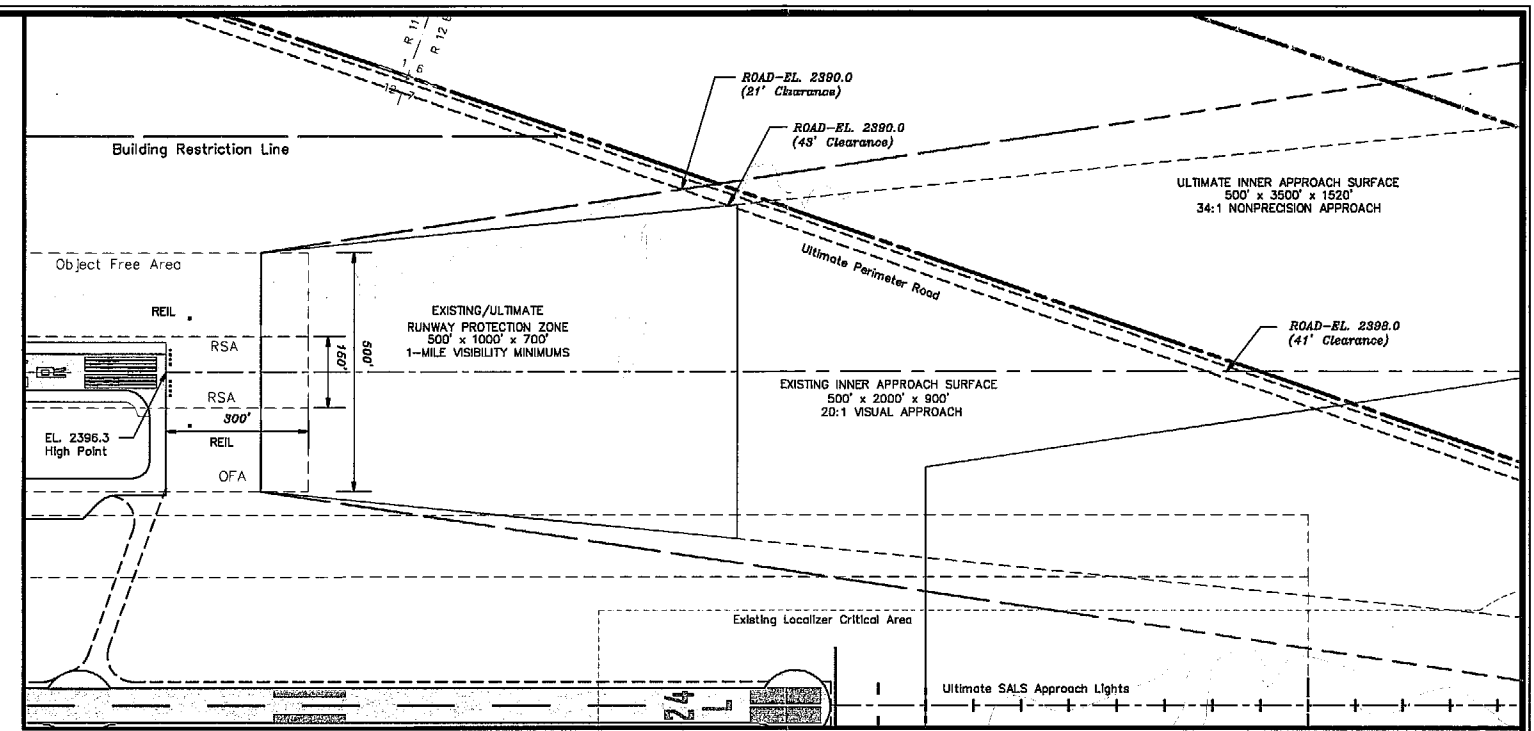
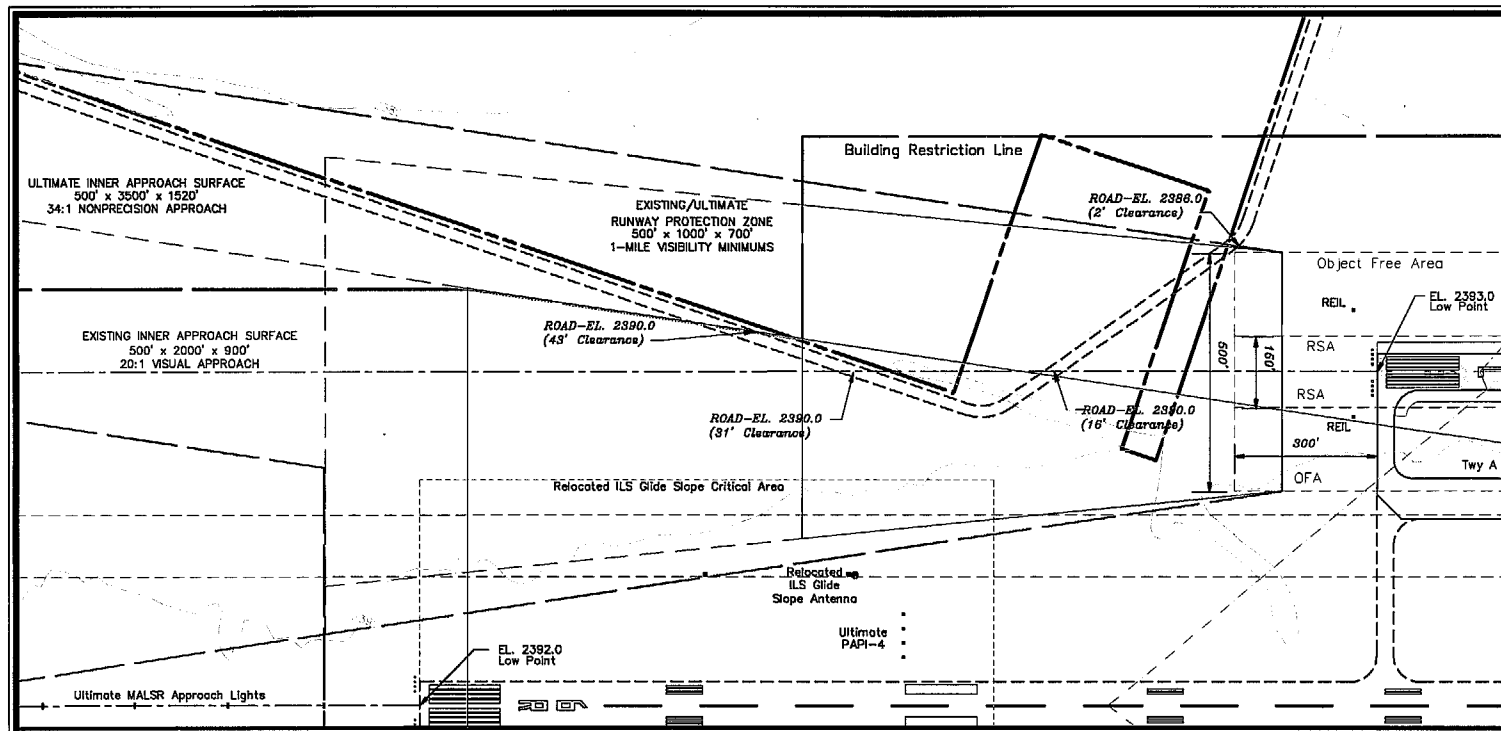
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Ryan Airfield
INNER PORTION OF RUNWAY 24L
APPROACH SURFACE DRAWING
Tucson, Arizona

PLANNED BY: Steven S. Benson
DETAILED BY: Larry D. Johnson
APPROVED BY: Steven S. Benson

June 25, 1999 SHEET 7 OF 11

Coffman Associates
Airport Consultants

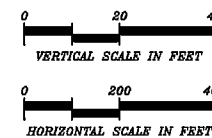


INNER PORTION OF RUNWAY 6L-24R APPROACH SURFACE

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-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
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-	-	-	-	-	-



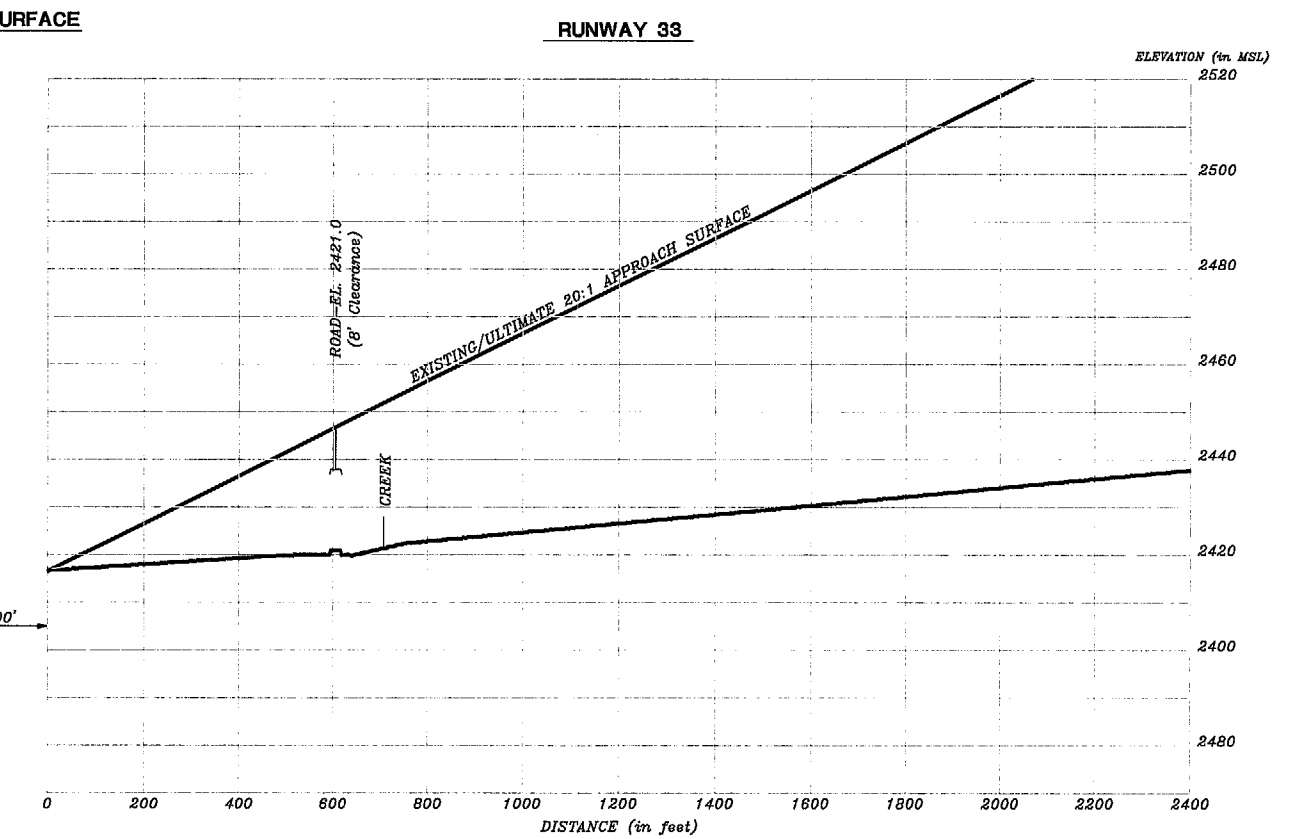
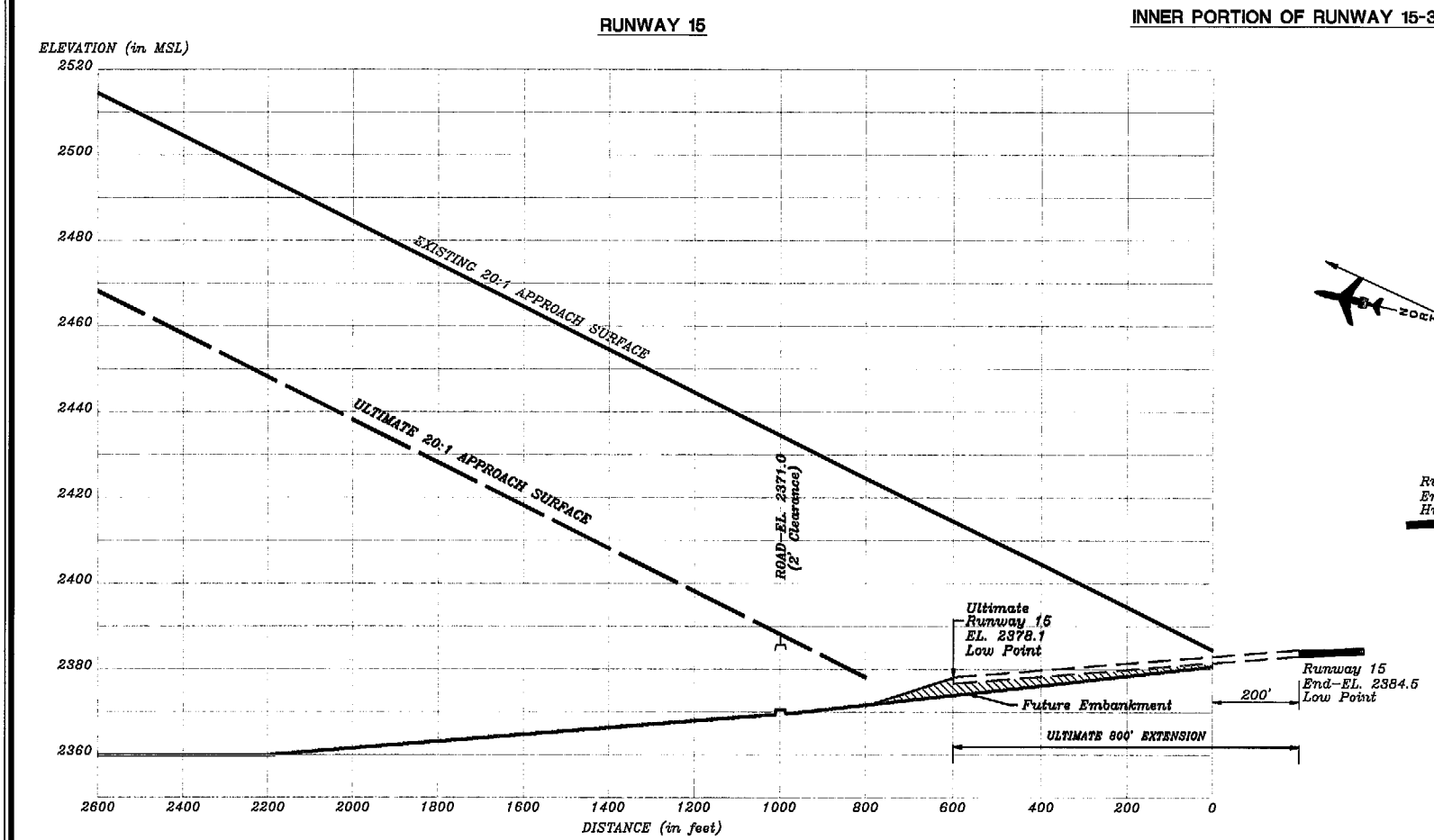
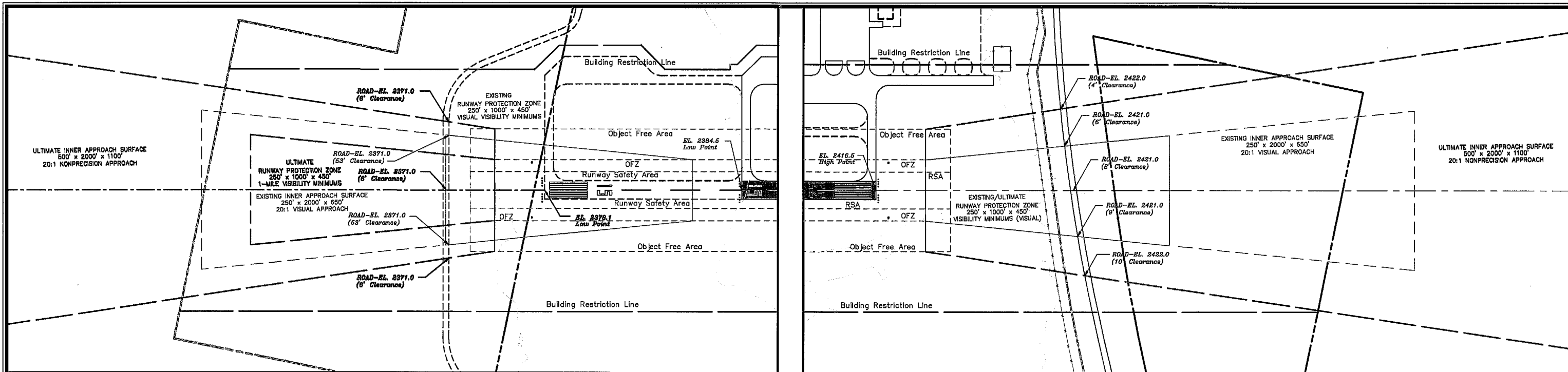
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Ryan Airfield
 INNER PORTION OF RUNWAY 6L-24R
 APPROACH SURFACE DRAWING
 Tucson, Arizona

PLANNED BY: Haven S. Benson
 DETAILED BY: Larry D. Johnson
 APPROVED BY: Haven S. Benson

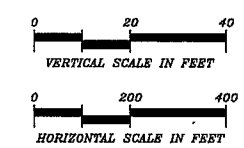
June 25, 1999 SHEET 8 OF 11

Coffman Associates
 Airport Consultants



OBSTRUCTION TABLE					
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-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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REVISIONS				DATE	BY	APP'D.
No.						
1						

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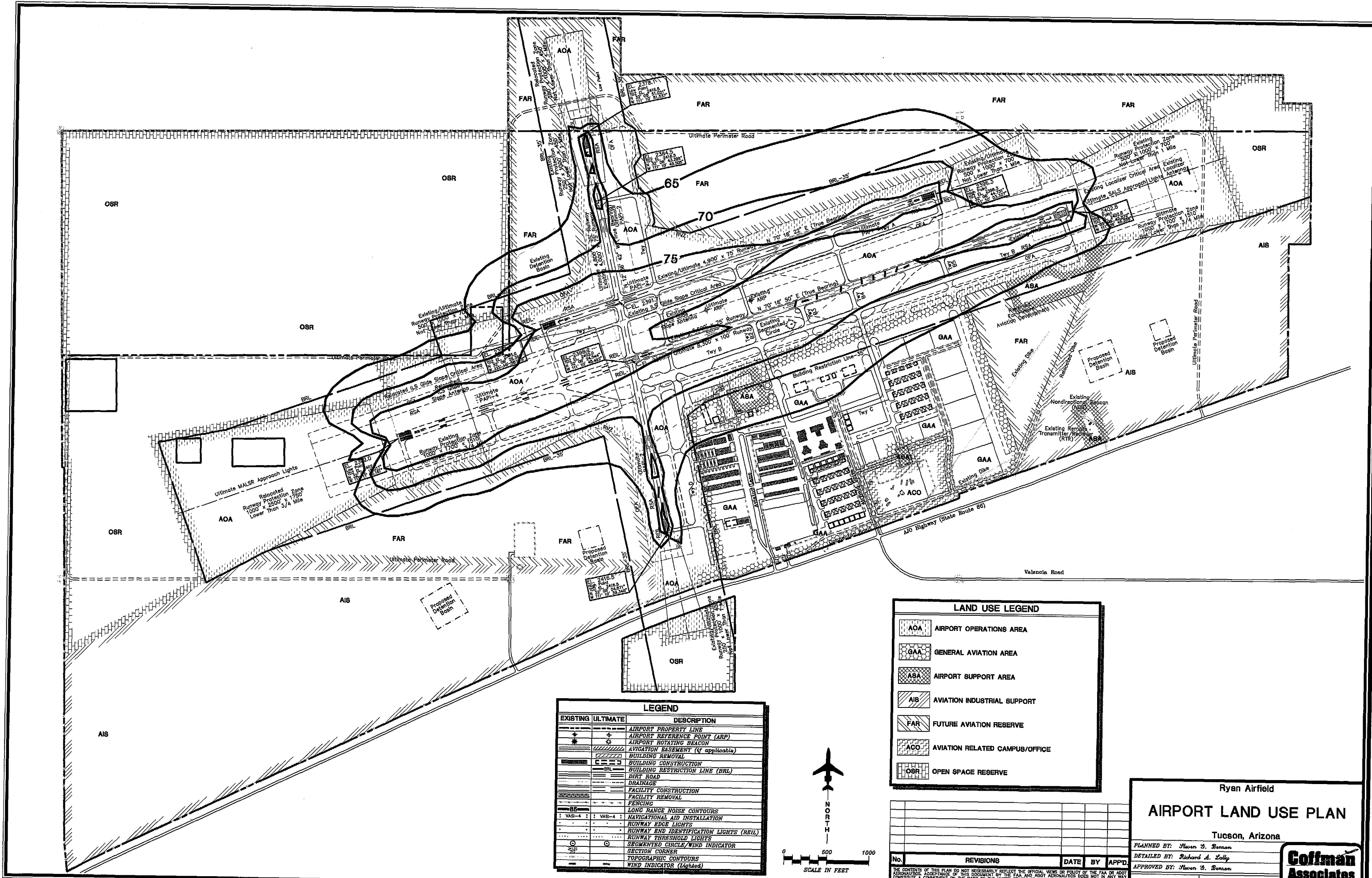
Ryan Airfield
INNER PORTION OF RUNWAY 15-33
APPROACH SURFACE DRAWING
 Tucson, Arizona

PLANNED BY: *Raven S. Benson*
 DETAILED BY: *Larry D. Johnson*
 APPROVED BY: *Raven S. Benson*

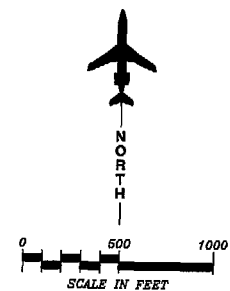
June 25, 1999 SHEET 9 OF 11

Coffman Associates
 Airport Consultants

Coffman Associates-101 RPH-1033.dwg Friday, June 25, 1999 7:23pm



LEGEND	
EXISTING	ULTIMATE
[Symbol]	[Symbol]
DESCRIPTION	
[Symbol]	AIRPORT PROPERTY LINE
[Symbol]	AIRPORT REFERENCE POINT (ARP)
[Symbol]	AIRPORT ROTATING BEACON
[Symbol]	AVIATION EASEMENT (if applicable)
[Symbol]	BUILDING REMOVAL
[Symbol]	BUILDING CONSTRUCTION
[Symbol]	BUILDING RESTRICTION LINE (BRL)
[Symbol]	DIRT ROAD
[Symbol]	DRAINAGE
[Symbol]	FACILITY CONSTRUCTION
[Symbol]	FACILITY REMOVAL
[Symbol]	FENCING
[Symbol]	LONG RANGE NOISE CONTOURS
[Symbol]	NAVIGATIONAL AID INSTALLATION
[Symbol]	RUNWAY EDGE LIGHTS
[Symbol]	RUNWAY END IDENTIFICATION LIGHTS (REIL)
[Symbol]	RUNWAY THRESHOLD LIGHTS
[Symbol]	SEGMENTED CIRCLE/WIND INDICATOR
[Symbol]	SECTION CORNER
[Symbol]	TOPOGRAPHIC CONTOURS
[Symbol]	WIND INDICATOR (Lighted)



LAND USE LEGEND	
[Symbol]	AOA AIRPORT OPERATIONS AREA
[Symbol]	GAA GENERAL AVIATION AREA
[Symbol]	ASA AIRPORT SUPPORT AREA
[Symbol]	AIS AVIATION INDUSTRIAL SUPPORT
[Symbol]	FAR FUTURE AVIATION RESERVE
[Symbol]	ACO AVIATION RELATED CAMPUS/OFFICE
[Symbol]	OSR OPEN SPACE RESERVE

REVISIONS			
No.	DATE	BY	APP'D.

Ryan Airfield

AIRPORT LAND USE PLAN

Tucson, Arizona

PLANNED BY: *Steven S. Benson*

DETAILED BY: *Richard A. Lally*

APPROVED BY: *Steven S. Benson*

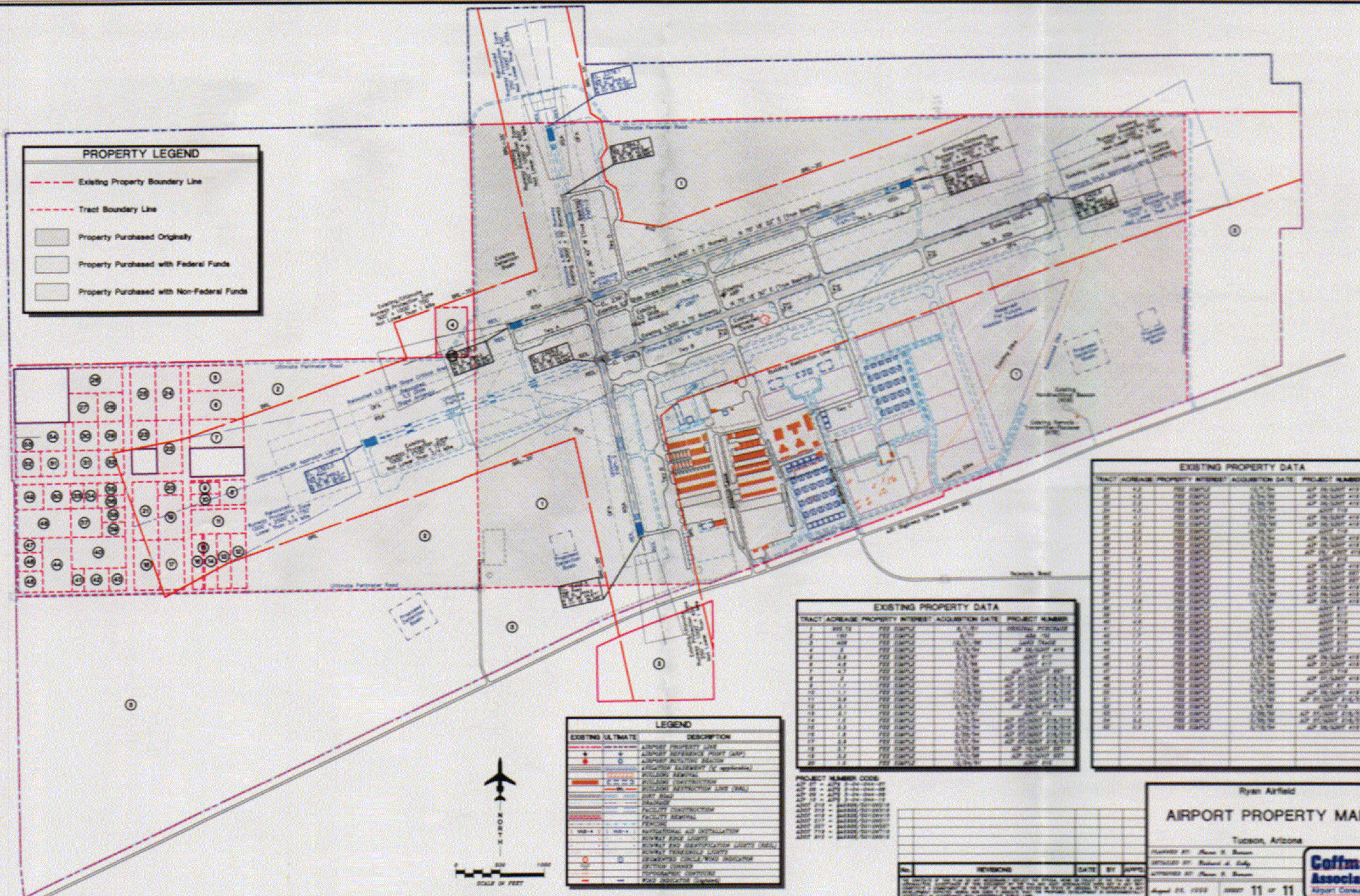
August 26, 1999

Goffman Associates

Airport Consultants

SHEET 10 OF 11

Plan: Ryan Airfield, AZ, August 2, 1999, August 2, 1999, August 2, 1999



EXISTING PROPERTY DATA				
TRACT	ACREAGE	PROPERTY INTEREST	ACQUISITION DATE	PROJECT NUMBER
1	200.12	FEI (STAFF)	6/1/79	EXISTING PROJECT
2	1.01	FEI (STAFF)	6/1/79	NEW PROJ
3	40.00	FEI (STAFF)	6/1/79	NEW PROJECT
4	5	FEI (STAFF)	6/1/79	NEW PROJECT
5	2.8	FEI (STAFF)	6/1/79	NEW PROJECT
6	4.0	FEI (STAFF)	6/1/79	NEW PROJ
7	4.0	FEI (STAFF)	6/1/79	NEW PROJECT
8	2	FEI (STAFF)	6/1/79	NEW PROJECT
9	1.1	FEI (STAFF)	6/1/79	NEW PROJECT
10	1.1	FEI (STAFF)	6/1/79	NEW PROJECT
11	0.8	FEI (STAFF)	6/1/79	NEW PROJECT
12	4.1	FEI (STAFF)	6/1/79	NEW PROJECT
13	4.1	FEI (STAFF)	6/1/79	NEW PROJ
14	1.1	FEI (STAFF)	6/1/79	NEW PROJECT
15	2.0	FEI (STAFF)	6/1/79	NEW PROJECT
16	1.8	FEI (STAFF)	6/1/79	NEW PROJECT
17	2.0	FEI (STAFF)	6/1/79	NEW PROJECT
18	2.0	FEI (STAFF)	6/1/79	NEW PROJECT
19	2.0	FEI (STAFF)	6/1/79	NEW PROJECT
20	1.0	FEI (STAFF)	6/1/79	NEW PROJ

[illegible]